

REMARKS

The Examiner rejects claims 1-11 in the subject application: Claims 1-11 (1 independent claim; 11 total claims) remain pending in the application.

The Examiner objects to the abstract and title of the invention, and suggests an appropriate title. Applicant has amended the title as suggested by the Examiner. Applicant has also amended the Abstract to remove the objected to phrase under M.P.E.P. §608.01(b).

Support for the various amendments may be found in the originally filed specification, claims, and figures. No new matter has been introduced by these amendments. Reconsideration of this application is respectfully requested.

35 U.S.C. § 102 REJECTIONS

The Examiner rejects claims 1, 4, 6-8, and 10 under 35 U.S.C. §102(b) as allegedly being anticipated by Freund (U.S. Patent No. 5,983,730, issued November 16, 1999 to Daniel Industries). Applicant respectfully traverses the rejection.

Freund Reference

Freund discloses an apparatus for measuring the time of flight of a signal between two points (or the time of flight of a reflected signal to return to the original point).¹ Freund discloses measuring the time-of-flight of a signal in an ultrasonic flow meter by (a) transmitting a signal through a flowing fluid with a transducer; (b) sensing the signal with a sensor to produce a received signal; (c) identifying a critical point (where the critical point is defined as the estimated beginning of the received signal), and (d) using the critical point for determining the time-of-flight of the signal.²

But Freund fails to disclose "filter processing means for removing a pulse flow rate component of the instantaneous flow rate of the fluid" as recited in claim 1 (and claims 4, 6-8, and 10, which variously depend from claim 1). The Examiner cites column 5, line 1 to column 6, line 26 as disclosing this claimed limitation. This section of Freund discloses the above measuring of the time-of-flight signal of a signal. More specifically, the time-of-flight measurement is performed by receiving a signal and digitizing the signal to form a received signal (that can be manipulated or enhanced).

¹ Freund, column 1, lines 16-19.

This received signal can be enhanced by filtering out high or low frequency noise or by stacking. The energy from the received signal is calculated to form a pre-conditioned signal.³ But neither the above discussion of Freund or this filtering aspect disclose "filter processing means for removing a pulse flow rate component of the instantaneous flow rate of the fluid" as recited in claim 1.

Freund also fails to disclose "stable flow rate calculation means for calculating a stable flow rate of the fluid based on an output from the filter processing means" as recited in claim 1 (and claims 4, 6-8, and 10, which variously depend from claim 1). It appears the Examiner is alleging that the critical point is the stable flow rate of the fluid of the claimed invention. In Freund, the received signal is enhanced by filtering and the energy from the received signal is calculated to form a pre-conditioned signal. Then, the pre-conditioned signal is averaged to form a conditioned signal, and a discrimination function determines the ratio of the energy of the received signal with a time shifted version of itself. The critical point is located with respect to the received signal. Then, the transit time can be calculated.⁴ But Freund does not disclose that the critical point is a stable flow rate of a fluid.

Thus, Freund fails to teach, advise, or suggest one or more of the claimed elements, so that claims 1, 4, 6-8, and 10 are patentable over Freund. Applicant respectfully requests withdrawal of these rejections.

35 U.S.C. § 103 REJECTIONS

The Examiner rejects claims 2, 3, 5, 9, and 11 under 35 U.S.C. §103(a) as allegedly being unpatentable over Freund in view of Herzl (U.S. Patent No. 3,709,034, issued January 9, 1973 to Fischer & Porter Company). Applicant respectfully traverses the rejection.

Based on the above discussion of claim 1 and the Freund reference, claims 2, 3, 5, 9, and 11 (which variously depend from claim 1) are also patentable over Freund over Herzl. Further, Applicant distinguishes the Herzl reference.

² Freund, claim 1.

³ Freund, column 5, line 64 to column 6, line 4.

⁴ Freund, column 5, line 64 to column 6, line 26.

Herzl discloses a signal conditioner for extracting the dominant frequency of an output signal of a swirl or vortex type flowmeter. A composite signal (CS) has a dominant fundamental frequency and low and high frequency components. When the CS signal (applied to a trigger 19) exceeds a level L1, the state of trigger 19 switches from (-) to (+). Then, when the amplitude of the CS signal drops to an intersection point Y in level L2, trigger 19 reverts to state (-). Trigger 19 generates a square wave whose periodicity corresponds to the dominant frequency of the signals.⁵

But Freund in view of Herzl fails to teach, advise, or suggest "fluctuation determination means for determining whether the instantaneous flow rate of the fluid pulses or not" as recited in claim 2 (and claim 3, which depends from claim 2). Herzl switches between (-) to (+) using the CS signal applied to trigger 19. But Herzl fails to teach, advise, or suggest "determining whether the instantaneous flow rate of the fluid pulses or not" as recited in claim 2 (emphasis added). Furthermore, Freund in view of Herzl fails to teach, advise, or suggest "when the fluctuation determination means determines that the instantaneous flow rate of the fluid pulses, the stable flow rate calculation means calculates a stable flow rate of the fluid based on an output from the filter processing means" as recited in claim 2 (and claim 3, which depends from claim 2).

Thus, Herzl in view of Freund fails to teach, advise, or suggest one or more of the claimed elements, so that claims 2, 3, 5, 9, and 11 are patentable over Herzl in view of Freund. Applicant respectfully requests withdrawal of these rejections.

⁵ Herzl, column 4, lines 31-41.

CONCLUSION

Applicant respectfully submits that the present application is in condition for allowance. Reconsideration of the application is thus requested. Applicant invites the Office to telephone the undersigned if he or she has any questions whatsoever regarding this Response or the present application in general.

Respectfully submitted,

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